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The Instrument for Evaluating E-Service Quality

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Abstract

This paper seeks to develop and test empirically the instrument for evaluating e-service quality. During scientific literature analysis we identified 14 e-service quality dimensions forming three scales: 1) a core e-service quality scale, 2) e-service quality recovery scale, and 3) website quality scale. These scales were tested empirically in quantitative research using online survey method. However, the empirical research results do not supported the suggested three scales. The findings show that e-service quality from customers' perspective is a four-dimensional construct, i.e. composed of four dimensions: 1) compensation, 2) responsiveness and fulfillment, 3) website operation, and 4) reliability. The exploratory and confirmatory factor analysis confirmed the validity and reliability of the four-dimensional construct. Thus, the instrument is recommended for evaluation of e-service quality.

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Keywords: E-service; Quality; Evaluation; Customer perception.

Introduction

E-service quality was initially developed by Zeithaml, Parasuraman & Malhotra (2000) to define e-service quality as "the extent to which a web site facilitates efficient and effective shopping, purchasing and delivery". According to the definition, the concept of e-service quality would cover from the pre-purchase phase to the post-purchase phase. Many researchers have, therefore, created frameworks that explain how e-service quality is created (e.g., Wolfinbarger & Gilly, 2003; Parasuraman, Zeithaml & Malhotra, 2005; Collier & Bienstock, 2006). Through an extensive literature on e-service quality analysis we found that there is no one conceptual framework for the

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evaluation of e-service quality, which covers the whole process of e-service delivery, from the information search, submission of the order, customer services, order delivery and satisfaction with ordered service or product.

Collier & Bienstock (2006) argue that the early studies on e-service quality (e.g., Lociacono, Watson & Goodhue, 2000; Yang, Peterson & Huang, 2001; Yoo & Donthu, 2001) focused on the interaction between the customer and the website, i.e. the operation of the website, but it does not include the whole process of e-service delivery. Later studies (e.g., Parasuraman Parasuraman, Zeithaml & Malhotra, 2005; Collier & Bienstock, 2006; Fassnacht & Koese, 2006) focused on e-service delivery process, i.e. studies presented that the quality of e-service is the result of the e-service perceived quality by the customer and e-service recovery quality, if there are failures. However, these studies do not deal with aspects of the quality of the website, what in our opinion narrows the customers' perception of e-service quality. Therefore, creating the instrument for the evaluation of e-service quality from customer's perspective we should integrate both of these approaches, i.e., the quality of the website and the quality of e-service delivery process. Based on the reasons above, the research problem is how to evaluate e-service quality?

The aim of the paper is to develop and test empirically the instrument for evaluation of e-service quality.

Research method: analysis of scientific literature, online survey, statistical analysis of data.

1. Theoretical background

The theoretical background of the research is based on Zeithaml, Parasuraman & Malhotra (2000, 2002) approach to e-service quality. These authors suggested the e-SERVQUAL model for measuring e-service quality and later they transformed it into two separate scales: E-S-QUAL and E-RecS-QUAL (Parasuraman, Zeithaml & Malhotra, 2005). E-S-QUAL what the authors call the core dimensions: efficiency, system availability, fulfillment, and privacy. The second scale, titled E-RecS-QUAL, responsiveness, compensation, and contact, encompasses the recovery part of the authors' conceptualization of e-service quality. We used the dimensions of E-S-QUAL and E-RecS-QUAL scales, presented by Parasuraman, Zeithaml & Malhotra (2005), as the starting point for the analysis of e-service quality, because these scientists contribution to theory of e-service quality evaluation is undoubted. Thus more, according to Collier & Bienstock (2006), E-S-QUAL and E-RecS-QUAL are important in conceptualizing the e-service quality.

E-service quality evaluation instrument is based on hierarchical quality conceptualization, which was used in models by Brady & Cronin (2001), Collier, & Bienstock (2006) and Fassnacht & Koese (2006), i.e. distinguishing primary and secondary e-service quality dimensions. Van Ossel (1998) argues that the ideal model of quality evaluation should include the set of full-scale dimensions. The quality dimensions should be universal, i.e. should explain the different perception of service quality, self-determined, i.e. should evaluate different aspects of quality, homogeneous and unambiguous, and clear. The number of dimensions should be limited as well. However, due to different approaches to e-service quality dimensions among studies, it was not easy to conceptualize dimensions of e-service quality.

Having the main attributes of quality dimensions in mind, we examined 24 empirical studies on e-service quality mentioned by Rowley (2006) or Kim, Kim & Lennon (2006). Conceptual papers and literature reviews were discarded. During literature analysis, we identified 14 dimensions forming three scales: 1) a core e-service quality scale (E-S-QUAL), 2) e-service quality recovery scale (E-RecS-QUAL), and 3) website quality scale (W-S-QUAL) (see Figure 1). Our identified e-service quality dimensions included the original seven dimensions which comprise the E-S-QUAL and E-RecS-QUAL scales plus seven additional ones. One of additional dimensions we label as *individualized attention* and incorporated into E-S-QUAL. Other six additional dimensions focused on website quality formed a website quality scale. Individualized attention can be understood as the empathy dimension of SERVQUAL (Zeithaml, Parasuraman & Malhotra, 2002). Furthermore, individualized attention was identified because responsiveness, originally used by Parasuraman, Zeithaml & Malhotra (2005) in E-RecS-QUAL, captures only the handling of problems and returns through the site. We state that individualized attention includes the customers' needs to individualize the service, get alteration services and special rewards. Based on the unique customer interaction with service organization through the website, we propose that a website quality should be considered by itself. The website quality scale (W-S-QUAL) emerged due to such reasons: a) the absence of human interaction in e-service should be compensated by excellence performance of website; b) customer interacts with website, and both search with information retrieval and the information content of websites have a role to play in

customer evaluation of service quality; c) service quality dimensions are perceived differently by online buyers and information searchers (Yang & Jun, 2002; Cai & Jun, 2003); d) Santos (2003) proposed that e-service quality consist of incubative and active dimensions using time – before and after a website is launched. We suppose, these scales present e-services that can be pure or comprised of tangible product and intangible service.

The conceptual framework of e-service quality is presented in Figure 1.

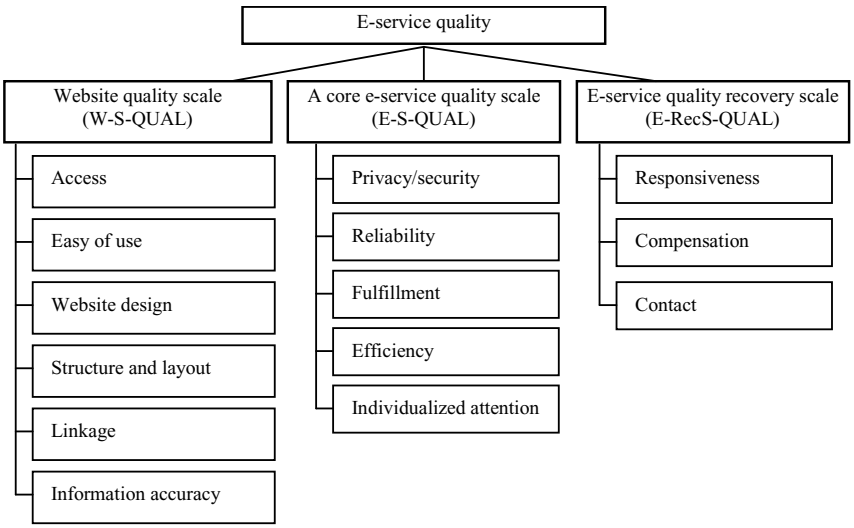

Fig. 1. The conceptual framework of e-service quality

2. Method

The purpose of the empirical research was to research empirically the e-service quality. The approach of quantitative research was applied. The questionnaire included three sections. Section A collected information about the respondents' experience of e-service usage. Section B gathered information about e-service quality. The 3-scale (54 statements) concerning e-service quality was developed for the survey. Respondents were asked to indicate their agreement based on the five-point Likert-type scale from (1) strongly disagree to (5) strongly agree. Section C comprised questions on demographic characteristics.

A convenient sample method was used for the research. The study population was members of academic community. We send out 1363 e-mails by known e-mail addresses with the invitation to participate in the research and fill in the questionnaire posted on the World Wide Web. We received 277 questionnaires (20.3% response rate). The research is a pilot study, thus all findings are applicable only to the study sample.

Data was analysed with descriptive statistics and high-abstraction statistics: factor analysis was used to identify e-service quality dimensions. SPSS 16.0 software was used for calculations.

3. Results

Demographics of the sample. Among the respondents, 181 (72.1%) identified themselves as online shoppers, other identified themselves as information searchers on the Internet or did not indicated, thus these answers of the respondents were deleted from the analysis. The biggest part of the respondents was woman (74.0%) dominated young (62.4%), i.e. up to 24 years and with higher education (76.2%). One-third (38.7%) of respondents were working students. The majority of the respondents use the Internet more than 5 years, and every day (resp. 70.7% and 87.8%). Almost 34% of the respondents buy e-service for 1-2 years.

The instrument for e-service quality evaluation. The empirical validation of the prosed e-service quality instrument was performed by exploratory and confirmatory factor analysis. The Bartlett's Test of Sphericity (Bartlett

X^2=4924, p=0.000) and Kaiser-Meyer-Olkin Measure of Sampling Adequacy (KMO=0.87) indicated a good applicability of the research data for exploratory factor analysis. According to Čekanavičius & Murauskas (2002), interpretive adjectives for the Kaiser-Meyer-Olkin Measure of Sampling Adequacy are: in the 0.90 as marvellous, in the 0.80's as meritorious, in the 0.70's as middling.

Seeking to ensure the reliability of e-services quality instrument, exploratory factor analysis (EFA) was performed 4 times till data meet these required criteria: (a) factor loading values >0.4 (as recommended by Čekanavičius & Murauskas, 2002); (b) factor Cronbach α>0.7 (as recommended by Čekanavičius & Murauskas, 2002; Collier & Bienstock, 2006; Parasuraman *et al*., 2005); and (c) factors with only one statement were excluded. Subsequently, EFA resulted in a pool of 27 remaining quality statements that were grouped in four dimensions of e-service quality. Thus, EFA results do not supported the suggested instrument (54 statements, 14 dimensions which formed three scales) for e-service quality evaluation. Nevertheless, our results suggest a high statistical measurement quality associated with the four constructs (Bartlett X^2=4557, p=0.000; KMO=0.92, Cronbach α range from 0.90 to 0.93). The four dimensions we labelled subjectively, based on the statements forming the dimension. These are: compensation, responsiveness and fulfillment, website operation, and reliability.

Then, confirmatory factor analysis (CFA) was used to check construct validity. The results revealed that the average variance extracted estimates (AVE), ranging from 0.57 to 0.67, exceeded the 0.50 lower limit (Hair *et al*., 2006), and construct reliability estimates (CR), ranging from 0.89 to 0.94, exceeded the 0.70 lower limit (Hair *et al*., 2006). Results are summarized in Tables 1 and 2.

Table 1. The factorization of instrument for measuring e-service quality (Alpha model, Varimax rotation, 71.16 of the variance, KMO 0.92).

Dimensions	No. of statements	Factor loadings of statements (L)	Variance explained (%)	Cronbach's α	AVE	CR
Compensation	3	0.56 - 0.95	41.89	0.90	0.67	0.89
Responsiveness and fulfillment	7	0.51 - 1.02	20.17	0.92	0.63	0.92
Website operation	10	0.66 - 0.89	5.41	0.92	0.60	0.94
Reliability	7	0.50 - 0.97	3.69	0.93	0.57	0.90

Hence, a statistical analysis of the results shows that the e-service quality evaluation instrument is suitable for use in further research - both questionnaire and its component scales are valid and reliable. Our scales the total explanatory ability is 71.16% and explains most of the of e-service quality definition from customers' perspective. The most important dimension for e-service quality evaluation is the compensation (variance explained 41.89%), the least important – reliability (variance explained 3.69%).

Summing up the results, it seems that evaluation of e-service quality from a consumers' perspective can be seen as a four-dimensional, i.e. consisting of four essential dimensions: compensation, responsiveness and fulfillment, website operation, and reliability. *Compensation dimension* consists of statements which are related to customers' attitude to the failure of e-service delivery process and customers' need for the recovery. The results indicate that very important for customers' is compensation when the ordered service/product doesn't arrive on time (L=0.95) and the return with minimum hassle (L=0.83). Thus, this e-service quality dimension implies the customers' strict requirements for organizations. It is likely that e-services are associated with a potential risk. *Responsiveness and fulfillment dimension* can be described as an organization fulfils its commitments, listens to the customers and provides clear, understandable information for them. The respondents of the research tend to require accurate services (L=1.02), organization's quick answers (L=0.98), and to deliver orders when promised (L=0.96). Less essential is a clear return policy and guarantee (L=0.51). This is a paradox because the results show that respondents need the possibility to return service/product without difficulty (L=0.83), but do not cares about formal return procedures and guarantees. It is likely that respondents have quite pragmatic approach – "the customer is always right". *Website operation dimension* shows customers' views on the website. The results analysis presents that well organized, accurate and up to date information at organization's site (L=0.86), and the site availability 24/7 for

business (L=0.66) are important for e-service customers. As a result, good website performance relates to the quality of e-service. *Reliability dimension* reflects consumers' relationship with the organization: reputation and image, ability to provide the promised service, and ability to solve problems. Respondents indicated the importance of organizations' reputation and image (L=0.97), and guarantee and privacy policy presentation on site (L=0.94), but the organization's ability to solve problems (L=0.50) is not that important. This means that the good reputation of the organization is associated with the quality of e-service. It is also possible to do logical connection with compensation dimension as problems can not arise when one deal with a reliable e-service organization. In addition, the respondents have low belief that the organization will be able to solve problems, that's why they believe that the organization has to compensate for problems it creates.

Table 2. Measures of study construct.

Scale	Statement
Compensation	Organization compensates me when what I ordered doesn't arrive on time.
	Organization picks up items I want to return with minimum hassle.
	Organization compensates me for problems it creates.
Responsiveness and fulfillment	Organization makes accurate services (accurate records of consumers, accurate account, etc.).
	Organization answers quickly when I call or write e-mail.
	Organization delivers orders when promised.
	Organization provides me with different options for payment, delivering and/or returning items.
	Organization is truthful about its offerings, it has in stock the items it claims to have.
	Organization takes care of problems quickly.
	Organization offers a clear return policy and guarantee.
Website operation	Information at organization's site is well organized, accurate and up to date.
	Organization's site is available 24/7 for business.
	Organization's site loads its pages fast and easy.
	Organization's site enables me to complete a transaction quickly.
	Organization's site provides useful and reliable information.
	Organization's site makes it easy to find what I need.
	There is good search system in organization's site.
	Organization's site provides information about service/product price, description, instruction and etc.
	Organization's site is simple to use.
	Organization's site is well organized (easy to get anywhere on the site).
Reliability	Organization's good reputation and image.
	Organization presents guarantee and privacy policy on its site.
	Organization's ability to convey trust and confidence.
	Organization's ability to provide the promised service carefully and consistently /stable.
	In case of problems it is possible to address to concrete employee of organization (contact details provided on the website).
	My order is quickly confirmed and kept by organization.
	Organization's ability to solve problems, the ability to answer the questions.

Conclusions

The literature analysis of e-service quality identified 14 dimensions which may form three scales: 1) a core e-service quality scale (E-S-QUAL), 2) e-service quality recovery scale (E-RecS-QUAL), and 3) website quality scale (W-S-QUAL). These scales represent the original seven dimensions which comprise E-S-QUAL and E-RecS-

QUAL, introduced by Parasuraman, Zeithaml & Malhotra (2005), plus seven additional dimensions. One of them - individualized attention - we assigned to a core e-service quality scale. Other six dimensions were related to the website features and were labelled as website quality scale. However, the empirical research results do not supported this proposed instrument (14 dimensions which formed three scales) for e-service quality evaluation.

Our findings show that e-service quality from customers' perspective is a four-dimensional construct, i.e. composed of four dimensions: compensation, responsiveness and fulfillment, website operation, and reliability. Compensation dimension reveals customers' attitude to the failure of e-service delivery process and their need for the recovery. Responsiveness and fulfillment dimension can be described as an organization fulfills its commitments, listens to the customers and provides clear, understandable information for them. Website operation dimension shows customers' views on the website. Reliability dimension reflects consumers' relationship with the organization: reputation and image, privacy policy, ability to solve problems. The results of empirical testing confirmed the validity and reliability of the instrument for evaluation of e-service quality. According to the results, the instrument is appropriate for using it in e-service quality evaluation from customers' perspective, so it is recommended for evaluation of e-service quality.

This study had some limitations related to study survey method, study sample (convenient sample, small variances in age, education and income) and the broad spectrum of e-services what customers implied filling the questionnaire (we have not specified a particular e-service). Therefore, we cannot draw any conclusions that would refer to all e-services customers from Lithuania. Nevertheless, the major contribution of the study is the instrument (dimensions and items) for e-service quality evaluation and its verification. The research results may be useful for online managers, online and offline service companies or retailers who seek to offer the high quality e-service.

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